

Applic. No. 10/675,772
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Reply to Office action of January 23, 2006

Claim Amendments

This listing of the claims will replace all prior versions,
and listings, of claims in the application:

Claim 1 (currently amended): A method for transmitting at
least one measuring position of a structural element for
measuring a characteristic dimension in a microscope, which
element is about to be formed on a mask for lithographic
projection, which comprises:

defining, in a first user unit, a circuit layout containing
the structural element that is to be formed;

transferring the circuit layout into a file with a format in
which the structural element that is to be formed is
represented by first data information including an allocation
of a position to a geometric shape;

generating second data information in the circuit layout
transferred into the file;

allocating a second geometric shape to the at least one
measuring position in the second data information to prevent

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the second geometric shape from bringing about the formation of an exposed structure on the mask in the event of an exposure;

transmitting to a second user unit the circuit layout transferred into the file and containing the second data information;

reading, in the second user unit, a the at least one measuring position of the second data information in the circuit layout transmitted with the file;

forming a control instruction for an exposure apparatus from the circuit layout;

exposing the mask with a structure pattern; and

finding the structural element on the mask at the at least one measuring position in a measuring device and measuring the characteristic dimension of the structural element by transmitting the mask and the at least one measuring position to a third user unit.

Claim 2 (original): The method according to claim 1, which further comprises:

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additionally allocating a first transparency to the first geometric shape of the first data information; and

additionally allocating a second transparency different from the first transparency to the second geometric shape of the second data information.

Claim 3 (currently amended): The method according to claim 1, which further comprises situating the at least one measuring position in a vicinity of the position of the first data information of the structural element that is to be formed on the mask.

Claim 4 (original): The method according to claim 1, which further comprises configuring the first and second data information as cells in a hierarchical structure of cells, each of the cells including a separate coordinate system with an origin coordinate and each cell being linked with a cell respectively thereabove in the hierarchical structure by a position of a respective origin coordinate in the coordinate system of the higher-ranking cell.

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Claim 5 (original): The method according to claim 4, which further comprises selecting GDSII as the standardized file exchange format.

Claim 6 (original): The method according to claim 1, which further comprises utilizing, as the measuring device, one of the group consisting of a scanning electron microscope, an optical microscope for determining the width of a structural element, and an optical microscope for determining the positional accuracy of a structural element.

Claim 7 (currently amended): The method according to claim 1, which further comprises carrying out the steps of the method for a number of structural elements with each having a respective at least one measuring position, ~~respectively~~.

Claim 8 (currently amended): The method according to claim 7, which further comprises providing the circuit layout as a memory cell field.

Claim 9 (currently amended): The method according to claim 8, which further comprises allocating a structural element located within approximately 10 μm of a margin of the memory cell field to one of the two items of data information of the at least one measuring positions position.

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Claim 10 (currently amended): A method for transmitting a circuit layout including at least one measuring position of a structural element for measuring a characteristic dimension, which element is about to be formed on a mask for lithographic projection, which comprises:

defining, in a first user unit, a circuit layout containing the structural element that is to be formed, the circuit layout including at least a first plane;

transferring the circuit layout into a file with a format in which the structural element that is to be formed is represented by first data information including an allocation of a position to a first geometric shape;

allocating the first data information to the at least ~~one~~
first plane;

generating a second plane to which is allocated no further data information representing structural elements that are to be formed;

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generating second data information in the second plane
including an allocation of a position to a second geometric
shape in the circuit layout transferred into the file;

transmitting to a second user unit the circuit layout
transferred into the file and containing the second data
information;

reading, in the second user unit, a measuring position of the
second data information in the circuit layout transmitted with
the file;

forming a control instruction for an exposure apparatus from
the circuit layout;

exposing the mask with a structure pattern; and

finding the structural element on the mask at the measuring
position in a measuring device and measuring the
characteristic dimension of the structural element by
transmitting the mask and the measuring position to a third
user unit.

Claim 11 (original): The method according to claim 10, which
further comprises:

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additionally allocating a first transparency to the first geometric shape of the first data information; and

additionally allocating a second transparency different from the first transparency to the second geometric shape of the second data information.

Claim 12 (original): The method according to claim 10, which further comprises situating the measuring position in a vicinity of the position of the first data information of the structural element that is to be formed on the mask.

Claim 13 (original): The method according to claim 10, which further comprises configuring the first and second data information as cells in a hierarchical structure of cells, each of the cells including a separate coordinate system with an origin coordinate and each cell being linked with a cell respectively thereabove in the hierarchical structure by a position of a respective origin coordinate in the coordinate system of the higher-ranking cell.

Claim 14 (original): The method according to claim 13, which further comprises selecting GDSII as the standardized file exchange format.

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Claim 15 (original): The method according to claim 10, which further comprises utilizing, as the measuring device, one of the group consisting of a scanning electron microscope, an optical microscope for determining the width of a structural element, and an optical microscope for determining the positional accuracy of a structural element.

Claim 16 (original): The method according to claim 10, which further comprises carrying out the steps of the method for a number of structural elements with at least one measuring position, respectively.

Claim 17 (currently amended): The method according to claim 16, which further comprises providing the circuit layout as a memory cell field.

Claim 18 (currently amended): The method according to claim 17, which further comprises allocating a structural element located within approximately 10 μm of a margin of the memory cell field to one of the two items of data information of the measuring ~~positions~~ position.

Claim 19 (currently amended): A method for transmitting at least one measuring position of a structural element for

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measuring a characteristic dimension, which element is about
to be formed on a mask for lithographic projection, which
comprises:

defining, in a first user unit, a circuit layout with the
structural element that is to be formed;

transferring the circuit layout into a file with a format in
which the structural element that is to be formed is
represented by first data information including an allocation
of a position to a geometric shape;

generating second data information in the circuit layout
transferred into the file;

allocating a reference string or name to the at least one
measuring position in the second data information;

transmitting to a second user unit the circuit layout
transferred into the file and containing the second data
information;

reading, in the second user unit, the at least one measuring
position of the second data information in the circuit layout

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transmitted with the file with the aid of the reference string
or name;

forming a control instruction for an exposure apparatus from
the circuit layout;

exposing the mask with a structure pattern; and

finding the structural element on the mask at the at least one
measuring position in a measuring device and measuring the
characteristic dimension of the structural element by
transmitting the mask and the at least one measuring position
to a third user unit.

Claim 20 (withdrawn): A circuit layout for a circuit in a
standardized file exchange format for transmission to a user
unit for producing a mask and measuring a characteristic
dimension of a structural element that is formed on the mask,
comprising:

at least one exposure step-formed structural element to be
formed on the mask, said structural element being represented
in the exchange format by first data information including an
allocation of a position to a shape with a content; and

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a measuring position for finding said structural element in a measuring step with a measuring device, said measuring position being represented by second data information including an allocation of said measuring position to one of no geometric shape and a geometric shape having an empty content, said measuring position being represented by locating said second data information in a vicinity of said position of said first data information.

Claim 21 (withdrawn): The circuit layout according to claim 20, wherein:

said structural element is a plurality of structural elements to be formed;

each of said structural elements is represented by said first data information;

a measuring position represented by said second data information is respectively allocated to each of said structural elements; and

said second data information forms a configuration with periodic intervals in the circuit layout.

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Claim 22 (withdrawn): In a user unit for producing a mask and measuring a characteristic dimension of a structural element that is formed on the mask with a measuring unit, a circuit layout for a circuit in a standardized file exchange format for transmission to the user unit, the circuit layout comprising:

at least one exposure step-formed structural element to be formed on the mask, said structural element being represented in the exchange format by first data information including an allocation of a position to a shape with a content; and

a measuring position for finding said structural element in a measuring step with the measuring device, said measuring position being represented by second data information including an allocation of said measuring position to one of no geometric shape and a geometric shape having an empty content, said measuring position being represented by locating said second data information in a vicinity of said position of said first data information.

Claim 23 (withdrawn): The circuit layout according to claim 22, wherein:

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said structural element is a plurality of structural elements
to be formed;

each of said structural elements is represented by said first
data information;

a measuring position represented by said second data
information is respectively allocated to each of said
structural elements; and

said second data information forms a configuration with
periodic intervals in the circuit layout.